

REMARKS

Claims 12, 14 and 17 are pending in this application. By this Amendment, claims 12, 14 and 17 are amended, and claims 11, 13, 15, 16 and 18-23 are canceled. Reconsideration based on the above amendments and the following remarks is respectfully requested.

I. The Claims Define Allowable Subject Matter

The Office Action rejects claims 11-12 and 21 under 35 U.S.C. §102(b) as anticipated by U.S. Patent No. 5,293,048 to Skunes et al. (hereinafter "Skunes"); claims 22-23 under 35 U.S.C. §102(e) as anticipated by U.S. Patent No. 6,111,262 to Takanashi (hereinafter "Takanashi"); and claims 19 and 20 under 35 U.S.C. §103(a) as unpatentable over Skunes in view of U.S. Patent No. 5,940,787 to Gelston (hereinafter "Gelston"). These rejections are respectfully traversed.

The Examiner asserts on page 2 of the Office Action that Skunes discloses a method of taking measurements using an optical apparatus, shown in Figs. 3 and 6, as claimed in claims 11-18. Applicants respectfully disagree with this assertion.

Skunes does not teach, disclose or suggest a method of making measurements of a rotating object for producing an output, using an optical measuring apparatus, which includes a light source that generates a beam of light and a detector that receives a beam of light, as claimed in amended claims 12, 14 and 17. Instead, Skunes discloses a method of drill detection. Skunes discloses a tool detecting device that detects the presence or absence of very small drills used to produce holes in printed circuit boards. Specifically, light 93 from a laser 60 is focused to a detection point at the surface of drill bit 42, as shown in Fig. 4. The light 93, reflected from drill bit 42, is sensed by detector 70. The drill is rotated at high speed, at a minimum of 30,000 rpm, as disclosed at col. 10, line 10. This rotation produces a detection signal which has a frequency in the order of 10,000 cycles per second (10 KHz) for a two flute drill. This detected frequency is in effect filtered by the circuit of Fig. 6 and a

"beam detect" signal is produced when the filtered signal is sufficiently high in the comparison with a reference voltage, as disclosed at col. 9, lines 14-45. Thus, the circuit senses the presence or absence of a drill bit as it rotates at the focal point.

Skunes further does not teach, disclose or suggest the movement of the drill relative to the beam while detection of the beam occurs, as disclosed in amended claims 12, 14, and 17. Specifically, the fluctuating signal is lost and the beam detect signal is not issued, if the drill bit is moved away from the focal point of the laser light. Skunes discloses continuous repetitive motion other than rotation, as disclosed in the Abstract, but the fluctuating detection would be lost if the drill of Skunes or the other object moves out of the beam. The device of Skunes, however, would not work without the continuously fluctuating signal, because the circuit of Fig. 6 would not produce an output. Therefore, the device of Skunes requires the motion detected to be rotation.

Further, a stripe of light is contemplated to ensure that at least part of the drill of Skunes is illuminated by the laser light, as disclosed at col. 8, lines 10 -25. Thus, Skunes does not disclose the claimed movement of the drill relative to the light as disclosed in the present invention.

Skunes also does not teach a method for making measurements of a rotating object and for producing output, using an optical measuring apparatus that senses the object, by displacing the object transversely relative to the beam while detection of the extent of the beam of light at the detector is performed, as claimed in amended claims 12, 14 and 17 and disclosed in the specification on page 5, line 5. This allows the measurement of the edge of the tool to take place in the claimed invention. Further, Skunes does not disclose the claimed "measurement". Instead, Skunes discloses a present/absent method of drill detection. Thus, Skunes does not disclose the displacement of a tool while it is being measured as claimed in amended claims 12, 14 and 17.

Further, Skunes does not disclose delaying the output for at least one revolution of the object, as claimed in amended claims 12 and 14. Instead, Skunes teaches a signal that is generated each time the drill flute is detected, where this fluctuating signal is indicative of the presence of a drill. Thus, the presence or absence of fluctuations in this signal which determines the further actions of the drilling machine. Thus, Skunes does not disclose a delay of output, as claimed in amended claims 12 and 14.

Finally, Skunes does not disclose a clock pulse that starts each time a detection signal is generated and that delays the output until the end of the clock pulse, as claimed in amended claim 17.

II. Conclusion

In view of the foregoing amendments and remarks, Applicants respectfully submit that claims 12, 14 and 17 define patentable subject matter, and that the application is in condition for allowance. Withdrawal of the rejections under 35 U.S.C. §102 is respectfully requested. Favorable reconsideration and prompt allowance of claims 12, 14 and 17 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



James A. Oliff
Registration No. 27,075

Randi B. Isaacs
Registration No. 56,046

JAO:RBI/gew

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OLIFF & BERRIDGE, PLC
P.O. Box 19928
Alexandria, Virginia 22320
Telephone: (703) 836-6400

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